

WHAT IS CLAIMED IS:

1. Reaction vessel for producing a sample, in particular a crystal, from a substance in liquid form or in solution, having several reaction chambers, each forming a separate gas chamber, consisting of at least one housing part, and each reaction chamber has a reservoir and several reaction areas co-operating therewith, connected to one another and to the reservoir in order to exchange gas, characterised in that the reservoirs and the reaction areas co-operating therewith are disposed immediately adjacent to one another in rows, distributed in a predeterminable, identical manner, these rows running parallel with one another, and each row of reservoirs co-operating with a row of reaction areas.

2. Reaction vessel as claimed in claim 1, characterised in that the reaction chambers are identical in structure.

3. Reaction vessel as claimed in claim 1, characterised in that the undersides of vessel floors of the reaction chambers come into contact with a plane parallel with the standing plane.

4. Reaction vessel as claimed in claim 1, characterised in that respectively consecutive rows of reservoirs are arranged at a predeterminable distance from one another.

5. Reaction vessel as claimed in claim 1, characterised in that respective consecutive rows of reservoirs are arranged at a same distance from one another.

6. Reaction vessel as claimed in claim 1, characterised in that respective adjacent reservoirs of two consecutive rows are offset from one another by a predeterminable same distance and in a same direction relative to the direction of the rows.

7. Reaction vessel as claimed in claim 1, characterised in that the reservoirs are arranged in a rectangular pattern.

8. Reaction vessel as claimed in claim 1, characterised in that at least one more or less plate-shaped housing bottom part is used as a housing part, comprising housing bottom parts co-operating with the reaction chambers and a frame extending laterally from an edge of a top face of the housing bottom part down in the direction to the undersides of the vessel base.

9. Reaction vessel as claimed in claim 1, characterised in that the vessel bottom parts comprise at least one reservoir and at least one reaction area.

10. Reaction vessel as claimed in claim 1, characterised in that three or several reaction areas are provided in the vessel bottom parts.

23. Reaction vessel as claimed in claim 1, characterised in that the vessel top parts are designed to have several reaction areas.

24. Reaction vessel as claimed in claim 1, characterised in that the vessel top parts are designed to have two reaction areas.

25. Reaction vessel as claimed in claim 1, characterised in that the reaction areas of the vessel top parts are designed to receive liquids.

26. Reaction vessel as claimed in claim 1, characterised in that the reaction areas of the vessel top parts are formed by recesses.

27. Reaction vessel as claimed in claim 1, characterised in that the recesses of the vessel top parts are of a cylindrical disc shape or in the form of a plate-like, quadratic cuboid.

28. Reaction vessel as claimed in claim 1, characterised in that the recesses of the vessel top parts are designed to have a capacity in the region of less than 5 μl .

29. Reaction vessel as claimed in claim 1, characterised in that, floors of the recesses forming the reaction areas in the vessel top parts are of an at least approximately convex curvature with reference to these recesses.

30. Reaction vessel as claimed in claim 1, characterised in that, seen in a plan view onto the standing plane, the rows of reaction areas of the vessel cover lie respectively adjacent to the optionally provided rows of reaction areas of the housing bottom part.

31. Reaction vessel as claimed in claim 1, characterised in that the frame of the vessel cover and the layout of the vessel top parts are designed to conform to a standard size of a micro-titre plate.

32. Reaction vessel as claimed in claim 1, characterised in that a predeterminable number of vessel top parts is provided in the vessel cover, the number being selected from a group based on the mathematical formula of 3×2^N where N is a natural number.

33. Reaction vessel as claimed in claim 1, characterised in that the vessel cover is made from a transparent plastics material.

34. Reaction vessel as claimed in claim 1, characterised in that a mask is applied to the face of the vessel cover remote from the reaction areas and, seen in a plan view down onto the standing plane, this mask surrounds the reaction areas with a light-screening surface.

35. Reaction vessel for producing a sample, in particular of a crystal, from a substance in solution or in liquid form, having several reaction chambers each forming a separate gas chamber, made up of at least one housing part and each reaction chamber has a

reservoir and several reaction areas co-operating therewith, connected to one another and to the reservoir in order to exchange gas, characterised in that the reaction chambers are in the form of prisms with a regular hexagonal base surface and these reaction chambers are disposed in a honeycomb arrangement.

36. Reaction vessel comprising at least a vessel bottom part with a vessel floor and vessel walls forming at least one reaction chamber, the reaction chamber having a reservoir for liquid agents and at least one reaction area separated from the reservoir and having a gas connection thereto, characterised in that the reaction chamber is covered by a vessel top part, which lies at least against the vessel walls, optionally with a sealing layer in between, and having at least another reaction area above the reservoir.

37. Reaction vessel as claimed in claim 36, characterised in that several reaction chambers are provided, each adjacent reaction chambers being separated from one another by a common vessel wall.

38. Reaction chamber as claimed in claim 36, characterised in that the reaction areas are of a vessel-type design and every two are separated from one another by a common wall.

39. Vessel cover for producing a sample, in particular a crystal, from a substance in solution or liquid form, having several reaction areas on an underside, characterised in that the

reaction areas are respectively disposed in rows in a predeterminable distribution, these rows being laid out parallel with one another.

40. Vessel cover as claimed in claim 39, characterised in that the reaction areas are disposed in rows in an identical distribution.

41. Vessel cover as claimed in claim 40, characterised in that the reaction areas are arranged in immediately adjacent rows.

42. Vessel cover as claimed in claim 39, characterised in that, on an edge of the underside, a frame is provided projecting beyond the underside.

43. Vessel cover as claimed in claim 39, characterised in that grooves are provided on the underside, by means of which the vessel top parts co-operating with at least one reaction area are bounded.

44. Vessel cover as claimed in claim 39, characterised in that the reaction areas are designed to hold liquids.

45. Vessel cover as claimed in claim 39, characterised in that the reaction areas are provided in the form of recesses.

46. Vessel cover as claimed in claim 39, characterised in that the recesses are of a cylindrical disc-shaped design.

48. Vessel cover as claimed in claim 39, characterised in that floors of the recesses are of an at least approximately convex curvature with reference to the floors.

50. Vessel cover as claimed in claim 39, characterised in that a predeterminable number of vessel top parts is provided, the number being selected from a group based on the mathematical formula of 3×2^N where N is a natural number.

51. Vessel cover as claimed in claim 39, characterised in that the material is a transparent plastics.

52. Vessel cover as claimed in claim 39, characterised in that a mask is applied to the face remote from the reaction areas and, seen in a plan view down onto the standing plane, this mask surrounds the reaction areas with a light-screening surface.